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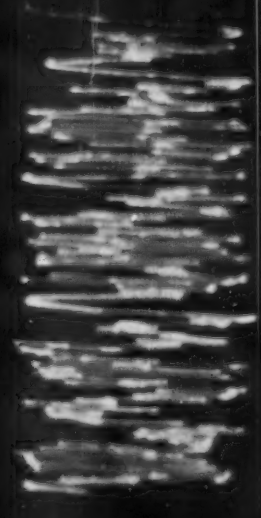
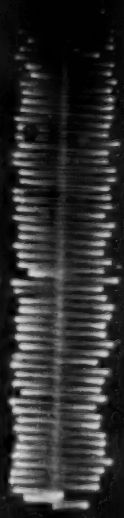
August 8, 1956

VOL. 74 NO. 2

PUBLISHED WEEKLY

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Super Detector

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A SCIENCE SERVICE PUBLICATION

## EDUCATION

# Wanted: Young Scientists

NOTED ANTHROPOLOGIST Margaret Mead has suggested that spending some time in the company of working scientists would inspire many more young students to want to be scientists themselves.

In a talk to science and mathematics teachers attending an eight-week summer science institute supported by the National Science Foundation at Hampton Institute, Hampton, Va., Dr. Mead, an associate curator of the American Museum of Natural History, advised that a promising young person should be given an opportunity to observe the activities of a working mathematician, for example, and to know him realistically as a human being. Such first hand information on science and scientists would be much more effective than reading books about such geniuses as Einstein, who seem awesomely remote to young readers.

More gifted and average high school students would be brought into the scientific community, Dr. Mead predicted, if they could be convinced that careers in science are "not just for unique people." Some popular magazines and even some teachers, she said, have pictured a scientist's life as one of inhuman drudgery that could be performed only by a superman.

Advising the educators on the important problem of encouraging gifted children, Dr. Mead said that if an exceptionally gifted child is too "different" from his classmates, he should be sent to a school "where he will not be persecuted or be allowed to persecute others with his superior knowledge."

Amplifying this advice, Dr. Mead told SCIENCE SERVICE that occasionally it happens that a gifted child is "asymmetric" or out of balance in relation to his classmates and possibly to his teacher. In such a case, every effort should be made to enroll the child in a school that is well-equipped to understand him and provide him with challenging opportunities.

Where this is not possible, extra opportunities should be provided outside of school. A gifted student who is scientifically talented should be given experience in the laboratories of nearby industries, experiment stations or other organizations where he may see people working in science fields, she said.

Such highly gifted children may be misunderstood and rejected by their classmates, Dr. Mead explained, because if they are "out of step" in one way or another, they try to make up for it by showing off their knowledge. Since this intellectual showing-off makes them unpopular with other children, they unfortunately make scholarly pursuits seem unattractive and unpopular, too.

Dr. Mead stressed the importance of teachers realizing that lack of sufficient science equipment in small schools in rural or underprivileged areas is balanced by their still having left that wonderful creature, the child who regards school as a rare privilege, rather than a chore. In a smaller school, she said, the teacher can put emphasis on individuals "and send them up, up, and up."

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**RARE BIRD**—The Kookaburra, an Australian native, is becoming a rare bird. Conservationists are concerned about its possible disappearance and are planning to take steps to protect it. However, as with many other rare animals, man and civilization are destroying much of its habitat. The Kookaburra is known for its strange cry which sounds like human laughter.

## PUBLIC HEALTH

## Alcoholism Is Nation's No. 3 Health Problem

ALCOHOLICS are being produced at the rate of 500,000 annually in the United States. Their life expectancy is 20 years less than the national average, a University of Illinois scientist said.

"Alcoholism is now the nation's number three health problem from the standpoint of incidence, lives lost and people disabled," Dr. Andrew C. Ivy reported at the Fourth Annual Institute of Scientific Studies for the Prevention of Alcoholism meeting in Washington.

Dr. Ivy said there are 8,000,000 persons afflicted with alcoholism—5,000,000 outright alcoholics, and another 3,000,000 "pre-alcoholics." He pointed out that 350,000 alcoholics die annually with the average life span being about 51 years compared to a life expectancy of 70 for non-alcoholics.

After a person has become an alcoholic, he can expect to live an average of 16 years, according to Dr. Ivy. These figures are based on medical records and life insurance statistics.

There has been a 12% decrease in the number of adult drinkers in the past 13 years, but an increase in the consumption of alcoholic beverages. Most of the decline in drinking is traced to women, who accounted for eight percent of the decrease.

"Increasingly, women are deciding it's not worth the price to keep up with the hard-pouring Joneses," Dr. Ivy said.

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## PUBLIC HEALTH

# Overrate Pollution Dangers

POLLUTION of sea water with sewage may be more of an aesthetic problem than a health problem.

A British physician told the First International Conference on Waste Disposal in the Marine Environment meeting in Berkeley, Calif., that the general public too often tends to blame sewage-polluted sea water for any intestinal illness contracted at seaside resorts.

Dr. B. Moore of the Medical Research Council, Exeter, Devon, England, cited several instances of incorrect attribution of such illnesses to sea bathing. These included an outbreak of paratyphoid fever, later shown to have been caused by ice cream, and a widespread outbreak of acute non-bacterial gastro-enteritis.

Results of studies on the isolation of salmonellae (a group of bacteria including the typhoid and paratyphoid bacilli), said Dr. Moore, indicate the risk of contracting enteric fever or other salmonella infections through bathing in polluted sea water is very slight.

Investigation of the bathing histories of children living by the seaside who con-

tracted poliomyelitis was also described by Dr. Moore. Here, the findings strongly suggested that a history of bathing in cases of polio is irrelevant, he said.

In another report to the Conference the disappearance of large kelp beds around major sewage outfalls in the ocean near Los Angeles and San Diego was discussed by K. A. Clendenning and W. J. North of the Institute of Marine Resources, University of California, La Jolla, Calif.

The causes of this seaweed recession are being sought in field and laboratory studies. The two scientists said, however, that the disappearance of kelp several miles from the outfalls is not caused by toxic agents. Reduced light penetration, on the other hand, seems to be a more likely cause of the detrimental effects of sewage on kelp.

Increased water turbidity and greater random abundances of phytoplankton, or minute plant life, reduce light penetration to deeply immersed young kelp plants. These then die off. But the established kelp plants, having a surface canopy, are better adapted for survival in turbid water.

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## ASTRONOMY

# Pin-Point Distance to Sun

For the first time scientists will know accurately the "astronomical unit," as the distance from the earth to the sun is called. This knowledge will aid space probes.

WITHIN TWO years, man will know accurately for the first time the distance to the sun. This distance, some 93,000,000 miles, must be known with much greater reliability than now before space vehicles can be sent on trips to planets with any assurance of a successful orbit or landing.

To make the most accurate determination to date of the sun's distance, a radio telescope with especially designed receiving equipment will tune in on the radio waves absorbed by neutral hydrogen in interstellar clouds. The experiment, proposed by astronomers at Yale University, will be made using the Naval Research Laboratory's 84-foot radio telescope located at Maryland Point Observatory, some 50 miles south of Washington, D. C.

Astronomers call the distance to the sun the astronomical unit. It establishes the basic scale of the solar system and is fundamental to space technology as well as astronomy.

The initial velocity of a rocket departing from earth must be changed from conventional units into a velocity in astronomical units per second in order to permit calculation of the gravitational orbit beyond the immediate vicinity of the earth. Thus an exact distance for the astronomical unit is not needed for lunar probes.

This change from terrestrial to astronomical units is now in error by the same percentage amount as the error in the present value of the astronomical unit, one part in 20,000. Using the radio telescope information, astronomers expect to find the sun's distance to one part in 280,000, or an accuracy of about 300 miles in the distance between the earth and sun.

At present, the two most important determinations of the sun's distance both depend on observations of the asteroid, Eros, but use different methods. The values obtained by the two methods differ by 89,000 miles, an "alarming" amount.

The radio telescope method involves obtaining a precise measurement of the earth's speed in its orbit around the sun. Using this newly determined value and standard equations, the astronomical unit can be found directly.

The telescope's receiving equipment will record the radio waves of hydrogen atoms in clouds in the space between the stars that are absorbing the radiation emitted by so-called radio "stars" at even farther distances. At one time during a year, the earth's orbital velocity will be directed toward the star. Six months later in the earth's journey around the sun, the earth's velocity will be directed exactly opposite.

The faraway interstellar cloud of atomic hydrogen gas will have a velocity with respect to the solar system that will remain

constant for both measurements. By taking the difference between the amount of the red shift in the hydrogen lines taken at six-month intervals, the cloud's effect is eliminated and a precise value for the earth's speed obtained. When combined with the time taken for the earth to make one orbit around the sun, the sun's distance is known.

The radio telescope measurements of interstellar absorption may also give a better determination of the lunar mass in the future, Dr. Dirk Brouwer, director of the Yale University Observatory, and Dr. A. E. Lilley, also of the Observatory, reported to the National Aeronautics and Space Administration.



**ANTI-MATTER**—The creation and decay of an antilambda is shown in this photograph taken in the six-foot bubble chamber at the University of California's Lawrence Radiation Laboratory. An antiproton from the Bevatron enters at the bottom of the picture, its track ends, and after a gap two V-shaped tracks occur. The V on the right is the product of the decay of an ordinary lambda particle. The V on the left is product of the decay of an antilambda. The particle on the left side of the V is an antiproton, which in the upper left hand corner, creates a four-pronged pi meson star.

NASA has allocated \$110,000 to support the research, which is also supported by grants from the Research Corporation and the Alfred P. Sloan Foundation. The Naval Research Laboratory's cooperation is directed by Edward F. McClain.

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**ANTI-MATTER DIAGRAMED**—This diagram shows the pattern of particle decay and formation.

## PHYSICS

## Physics Conference Sees Anti-Lambda Photograph

THE NINTH Annual International Conference on High Energy Physics drew some 60 scientists from the United States to Kiev, one of the largest cities in the U.S.S.R. It was the first time this yearly gathering of top level physicists had been held in Russia.

The specialists spent ten days exchanging the latest information on what makes up the nucleus of an atom and how it behaves when smashed apart by atomic particles. They were trying to bring some sense of order to the crazy, mixed-up particles having unpredictable behavior patterns found in atomic cores.

Some 25 of these odd particles are now known, and most of them have left their tracks in photographic emulsions so that their characteristics can be studied in detail. One of the newest to be so studied is known as an anti-lambda, a chunk of anti-matter that annihilates in an encounter with normal matter, both disappearing to release tremendous amounts of energy.

The anti-lambda photograph was taken in the six-foot bubble chamber at the University of California's Lawrence Radiation Laboratory, which is supported by the Atomic Energy Commission. The experiment producing this new "strange" particle was run by Drs. Lynn Stevenson, assistant physics professor, and Philippe Eberhard, on leave from the Centre National de la Recherche Scientifique of France, under the direction of Dr. Luis W. Alvarez.

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## ANTHROPOLOGY

# Study Ancient Farming

THE PEOPLE who lived on the Negev, Israel's arrow-shaped desert pointing to Egypt, thousands of years ago were not as scientific as scientists today think.

The mysterious cone-shaped piles of rocks found near their ancient cities had nothing to do with water flow and control, one scientist claims. In fact they were probably just what the Bedouins today call them, "grape mounds" or "vineyard heaps."

We have given the Byzantines credit for more scientific knowhow than they had, Prof. Philip Mayerson of New York University reports. Recent explanations of the rock piles as serving to change moisture in the air into usable ground water simply do not check out, he says.

Neither is it likely that the mounds of rock were used to increase the rate of soil erosion, thus causing the deposit of more soil in the terraced wadis, or dry river beds, below. There are two disadvantages to the theory that the mounds were built to provide more efficient runoff of water.

It is doubtful that the ancient farmer knew raindrops pounding on cleared soil would help make a sealing crust which would in turn increase surface runoff and

guide the rain water where it was needed, Prof. Mayerson says.

Opposed to these theories are the following "facts," he explains: the presence of a stone cover over many areas where the mounds are found; their variety in size, shape, pattern and location; their location in places where they could guide neither soil nor water to predetermined spots.

In contrast to these explanations of the mysterious piles, Prof. Mayerson proposes that they served for the cultivation of grape vines and perhaps even of trees.

Present-day knowledge of vine culture would support this, he says. The Old World grape is one of the most drought resistant fruits known. Also it is "remarkably adaptable" to growing in any kind of soil, including those that are salty, gravelly, or full of calcium carbonate.

It is difficult to account for the rocky piles except as the result of "digging pits and trenches in which vines and an occasional tree were planted," Prof. Mayerson concludes, in a recent issue of the *Bulletin of the American Schools of Oriental Research*.

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## TECHNOLOGY

# Detect Past Motion

A METHOD of superimposing the past on the present is enabling a West Coast scientist to detect movement that might otherwise go unnoticed.

The method is applicable to moving and still films and to television.

By simultaneously projecting scenes taken at two different times, moving parts in the scene are made to stand out vividly. Non-moving parts are largely canceled and appear as an unobtrusive gray.

Developed by R. Stuart Mackay, Radiological Research Laboratory, University of California Medical Center, San Francisco, the method is described in *Science* (July 24). Dr. Mackay explains that applications include "the study of motion in general and especially that propagated as waves, but my special interest is in speech and motion studies in connection with X-ray movies."

To study a motion picture in this way, Dr. Mackay reports, the original print and a negative print are superimposed. Then one is shifted a few frames ahead or behind the other, which in effect combines the past and present.

In projecting the double film, of a watch, for example, all of the non-moving parts (the case and the dial) appear gray on the screen. This occurs because the non-moving parts coincide—the bright of the negative with the dark of the positive, and vice versa—and they tend to cancel into a dull gray.

But, due to its motion, the second-hand does not coincide on the two films. Its double-image stands out on the screen, very

light from the negative and, displaced slightly forward or back, very dark from the positive.

Motion can be viewed similarly with slide projectors using positive and negative transparencies shot at different times.

Employing the method in television, the actual, rather than apparent, present is seen along with a somewhat older image. The incoming signal is split, thus sending the same image along two different pathways. One signal travels to the picture tube. The other is recorded on video tape, stored momentarily, then played back into the picture tube circuit. The result on the viewing screen is a double image, exactly coinciding, except for the vividly outstanding moving parts.

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## MEDICINE

# Drugs, Regular Care Cut Rheumatic Fever Relapse

DRUGS HAVE reduced recurrences of rheumatic fever from 20% to less than 1%.

A rheumatic fever patient who visits his doctor regularly, takes care of himself and takes preventive drugs should never have a recurrent attack, a pediatrician reported.

The most acceptable drug is penicillin, Dr. Benjamin B. Berman of Granite City, Ill., told scientists at the Illinois State Medical Society's meeting in Chicago. When it cannot be used, sulfonamides, tetracyclines and erythromycins are also effective.

Since rheumatic fever attacks are directly related to the presence of a type of streptococcus destructive to red blood cells, the patient must take these drugs as long as the possibility of such infection exists. This may range from five years to a lifetime.

"Since most patients are children," he said, prevention of recurring attacks "becomes the problem of the parents." With educations, they should be aware of the dangers of these attacks of rheumatic fever and should insist on the preventive program.

Dr. Berman pointed out that Illinois patients who cannot pay for drugs or a doctor's care may obtain treatment through the crippled children's division of the University of Illinois.

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## AERONAUTICS

# Find Strayed Bomber

The discovery of a B-24, crash-landed in the Libyan desert during World War II, presents a mystery to Air Force sleuths who are trying to learn why and how the crash occurred.

THE RADIO compass aboard the World War II bomber, the "Lady Be Good," should have told the plane's crewmen that they had safely returned home from their first bombing mission. Instead, they crash-landed.

Discovered early in May, 16 years later, in the Libyan desert, the abandoned B-24's radio compass was still in perfect working order despite the crash, the U.S. Air Force reported.

As the plane and its crew of nine passed over their comrades at the operational base at Soluch, Libya, on the night of April 4, 1943, the plane's radio compass needle should have spun around 180 degrees indicating that "home" was now in the direction of the plane's tail, not its nose.

The tragic story of what happened to 25 bombers charged with bombing Naples harbor has now been pieced together by Air Force Capt. Dennis E. McClendon.

Twenty-five unescorted bombers were to assault Naples harbor. These were arranged in two sections, A and B. They were to hit the target at high altitude at dusk, break formation, and slip back to Soluch individually at lower altitude under cover of darkness.

To reach Naples at dusk, the planes began taking off at 1:30 p.m. on April 4 in a blinding sandstorm. Section A promptly lost one plane because of engine and supercharger troubles aggravated by the sandstorm. The other 11 planes hit the target and returned safely.

Section B, containing a new B-24 (the "Lady Be Good") flown by First Lt. William J. Hatton, the plane recently found, became airborne between 1:45 and 1:50 p.m.

Only four planes flew near the target, and only three of these returned safely.

As a result of defective superchargers and engines, oil leaks and gas leaks, only six of 13 planes remained in Section B. By 7:30 p.m., the waist gunners' oxygen masks had frozen in two of the planes, and the gunners blacked out. By diving to revive the gunners, the pilots of both planes lost the formation and went home.

The "Lady Be Good" then apparently assumed lead of the remaining four planes, which reached Sorrento, about 30 miles south of Naples, at about 7:50 p.m. The sun had been down for 15 minutes at the 25,000 foot altitude, apparently too dark to bomb the target. The planes broke formation and headed back to Soluch under orders to maintain absolute radio silence.

One plane landed on the British island of Malta, low on fuel, at 10:45 p.m. Another made it back to Soluch at 10:45 p.m. A third landed at 11:10 p.m. An hour and two minutes later, the Benina, Libya, radio direction finder station spotted Lt. Hatton's B-24 over the Mediterranean Sea headed back on a bearing of 330 degrees. The plane was exactly on course for Soluch, but no one knows why it was so late.

Apparently, the Air Force said, Lt. Hatton continued watching for the coastline but missed seeing it in the hazy darkness. With three of the plane's engines out of gas and the fourth drinking its last few pints, the crew parachuted into the Libyan desert at a point from which there could be no escape by foot.

Search parties, still combing the area, have found a 50-mile trail marked with strips of

parachute. They hope to find further evidence of the crew's ultimate fate.

There are several circumstances that help explain the Lady Be Good's erratic behavior.

This was the crew's first combat flight.

The sandstorm which occurred as the planes took off on their bombing mission possibly affected the plane's engines.

The Lady Be Good's pilot may, in the darkness, have mistaken the desert sands for ocean. This could explain the plane's position. Since the weather was hazy, it is possible that, discounting the radio compass, Lt. Hatton could have flown over the coastline and missed identifying it.

The plane crashed on a sand and gravel plateau about 500 feet above sea level. Seventy miles to the north, and in a "U" shape around the plane is the impassable Libyan Sand Sea. To the south, 100 miles, is a 2,300-foot mountain range which seals off the south of the "U" shape. It is apparently impossible to escape the plateau either by foot or on camelback. Air Force officials report that desert nomads never visit the land.

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## MEDICINE

## Puffing Out Match Is Sure-Fire Medical Test

FOUR MICHIGAN DOCTORS have evolved a sure-fire bedside medical test—blowing out a lighted book match.

This simple huff-and-puff technique can be used to measure the seriousness of blockage in the airway of a patient suffering from pulmonary diseases.

These patients usually present signs of airway obstruction by wheezing and taking a long time to breathe air out of their lungs, the team explains in the *Journal of the American Medical Association* (Aug. 1).

But these bedside signs do not give the doctor the necessary information required to determine the patient's respiratory function. It is usually evaluated by two rather complicated tests that require the use of mechanical devices which cannot always be brought to a bedside.

The doctors gave the match test to 126 patients with various pulmonary diseases. Then they gave the two standard tests, correlating the results of the three tests.

The test itself consists of holding a lighted book match six inches from the mouth of the patient. It is important that the patient blow with his mouth wide open, not with pursed lips, the doctors say.

This simple test proved to be a favorable technique when compared to the results of the two standard tests. It should be used as a screening procedure, indicating whether or not more specific tests of pulmonary function should be performed, Drs. Thomas H. Snider, John P. Stevens, Freeman M. Wilner, and Benjamin M. Lewis of Dearborn's Veterans Administration Hospital, and Wayne State University College of Medicine, Detroit, conclude.

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**DOWNED PLANE**—The mystery plane, the "Lady Be Good," is examined in her desert bideway. One engine is still operative. The tracks at the right are of recent origin.

## OCEANOGRAPHY

# Measure Sea's Heat

**Tiny sea animals that coil to the left or to the right may provide oceanographers with a new way to estimate the temperatures of the ancient oceans.**

MICROSCOPIC sea animals, whose empty shells make up a large part of ooze at the ocean bottom, are helping scientists tell how cold it was—and where—during the last ice age.

Some of the animals, known scientifically as *Globigerina pachyderma*, are coiled snail-fashion to the left while others coil to the right. Samples of bottom mud taken from various ocean bottoms had shown that there is a relationship between coil direction and surface water temperature. (When alive the tiny sea animals live near the water's surface.)

Now, a geologist reports in *Science* (July 24), it appears that a "reduction in total radiation from the sun" may have caused the last ice age. Core samples taken from the Arctic Ocean, the North Atlantic and connecting seas support this theory, says David B. Ericson of the Lamont Geological Observatory in Palisades, N. Y. Such causes as a change in the circulation pattern of the ocean have been proposed as an explanation of the "Pleistocene refrigeration," he says.

By plotting the whereabouts of left-coiling and right-coiling *Globigerina*, Mr. Ericson found left coiling was dominant near Antarctica, while right coiling was dominant in more northerly samples. "Left-handed" animals are associated with colder temperatures and "right-handed" with warmer temperatures.

The distribution of the two forms of

*Globigerina* in relationship to one isotherm, an imaginary line along which the temperature is the same, has been established. With more sample cores from the ocean floor, Mr. Ericson believes it will be possible to estimate how far south this isotherm of close to 45 degrees Fahrenheit went at the peak of the last ice age. Then, he predicts, scientists can estimate how low the North Atlantic temperature went.

The boundary between the two animals was farther south during the last ice age, supporting the conclusion that the land glaciers were accompanied by general cooling of the North Atlantic.

Sample cores from more southerly stations are needed before the researchers are able to fix temperature changes more definitely.

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## ZOOLOGY

## Animals of Iraq Victims Of Years of Slaughter

IRAQ, THE LEGENDARY Garden of Eden, was once the home where the bison, and elephant, rhinoceros and lion, roamed. Man, however, has played a bloody role in destroying the rich animal-life of the country.

An inventory of Iraq animals is now available that identifies local animals as far

back as 25,000 years ago. How man has virtually exterminated the animal population in Iraq is told by Dr. Robert T. Hatt, director of the Cranbrook Institute of Science, Bloomfield Hills, Mich.

Royal hunts, "great game drives with enormous slaughter," were characteristic of the earlier years. There are ancient documents reporting hunts in which hundreds of lions and wild bulls were taken along with elephants by the dozen, ostriches, giraffes and onagers or wild asses. The development of the great city-states and the introduction of riding horses and chariots further influenced the decline in wildlife, Dr. Hatt points out.

Today automobiles and hunters equipped with guns, even machine guns are used, give gazelles and other desert animals little chance for survival, he warns. Species now threatened with extinction include the bear, leopard, cheetah, wild sheep and goat, roe deer, gazelle, badger, marten and squirrel.

"At present in Iraq all game is hard put to find food or refuge," Dr. Hatt says. "...Public opinion in Iraq is not yet ready to support effective protection and indeed, where the human population pressure is so great, there is little chance to give adequate protection through establishment of preserves. Neither the mountains nor the open deserts can be effectively patrolled."

Approximately 100 species, living and extinct, are described by Dr. Hatt in his report "The Mammals of Iraq" published by the Museum of Zoology, University of Michigan. He spent several months in the country, studying its wildlife.

*Science News Letter*, August 8, 1959

## ENGINEERING

## Standards for Screws To Aid Missile Repair

THE AMERICAN Standards Association has written standards for screw threads so fine they cannot be seen with the naked eye.

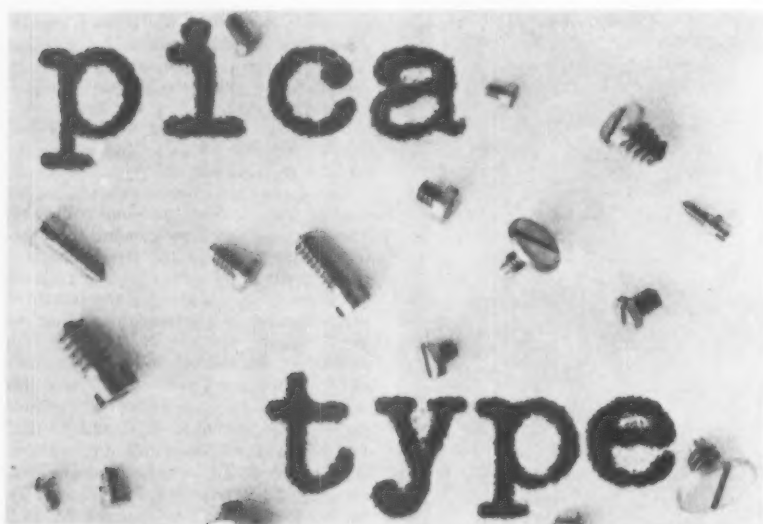
Lilliputian screws used in delicate instruments and controls for missiles and rockets are so tiny the smallest can be hidden in the dot of a typewritten "i". About 75,000 of these are required to fill a thimble. Their diameters range in size from 0.01 inch, about three times the diameter of a human hair, to 0.06 inch.

No standards for such screws have been available until now. Thus in the absence of standard screws, even in the watch industry, it became necessary for engineers to design special screws for their new missile instruments and controls.

Not only was this a waste of time, but the mounting complexity of stocking spare screws for maintenance of the instruments was rapidly producing headaches around the country.

In time, said the ASA, it may be possible to limit production and inventories to several lengths of screw in each of 14 standard diameters. The standards were drawn up by an ASA committee with backing of the American Society of Mechanical Engineers and the Society of Automotive Engineers.

*Science News Letter*, August 8, 1959



**SMALL SCREWS**—The small size of these screws can be judged by comparing them with the enlarged letters of the word "pica." The new American Standard fixing their sizes will insure interchangeability among these small screws.

## AGRICULTURE

# 'Cides Can Harm Man

THE CASE of the airplane pilot who survived a crash uninjured, walked away from his downed plane and was dead within five hours is not a mystery.

The crash killed him—he was flying an agricultural aircraft containing 100 gallons of deadly parathion, a pesticide. The lid of the pesticide tank opened when the plane crashed and the pilot's clothes were soaked with the liquid "bug killer."

Although it is not always so easy to identify a pesticide as the killer, the National Office of Vital Statistics has collected some mortality figures. Including those accidental poisonings where the cause of death may be due to pesticide poisoning, there were 61 fatalities in 1957. This is probably a conservative figure. The number seems to vary slightly from year to year, Miss Lillian Guralnick of the vital statistics office said.

Among the hundreds of chemicals being used now as pesticides and insecticides, it is the group known as organic phosphates that cause the most harm. Parathion, TEPP, demeton and phosdrin are the most poisonous. It takes only a few drops of the concentrated material to kill a man. Furthermore, these pesticides are easily absorbed by the body through the skin: contaminated clothing, and breathing dust or sprays are all known ways that the poison gains entrance to the body.

An effective antidote is available. How-

ever, prompt action is needed. Persons who use these organic phosphate compounds should be extremely careful in applying them and in caring for their protective equipment such as respirators, work clothing and masks.

Soap and water destroys the chemicals rapidly and thorough washing is an effective protection.

Symptoms of poisoning include disturbed vision, extra fluid in the mouth, nose and lungs, marked increase in sweating and pinpoint-sized pupils. The services of a physician should be obtained.

Science News Letter, August 8, 1959

## PHARMACOLOGY

## Data Suggest Some Drugs Cause Permanent Upset

SOME "WONDER" drugs may cause permanent harmful effects long after patients have stopped taking them.

A study of the after-effects of some drugs on rats resulted in a plea to drug companies by a psychobiologist. Test the long-range effects of drugs upon animals and their possible connection with humans, he urges.

To his knowledge, drug companies test the side-effects of drugs at the time of their use, but do not test the effects of drugs when they are no longer needed, Dr. Curt P. Richter told SCIENCE SERVICE. Dr. Richter

of the Henry Phipps Psychiatric Clinic at Johns Hopkins Hospital, Baltimore, reports the results of his rat experiments in the *Proceedings of the National Academy of Sciences* (July).

An antibiotic, antithyroids, a pain killer, an adrenal hormone and a female hormone were tested on rats.

Results ranged from an interrupted reproduction cycle to just plain inactivity. These reactions depended upon the drug each rat received. Not all rats exhibited these after-effects, he points out.

Yet these tests demonstrate that prolonged administration of several commonly used drugs and hormones are capable of producing lasting changes such as abnormal food and water intake. One rat that received sulfamerazine, for example, was fine during the period when the drug was taken daily.

When the drug was discontinued, however, the animal's daily food intake began to fluctuate as did his activity. Sometimes the rat ate nothing and did nothing. At other times he ate large portions of food and ran around a drum, increasing his activity, at a furious pace.

A total of 57 rats were observed in this study. Although this is not a large number, and although not all of the rats showed changes, the fact remains that these effects never occur in normal animals, Dr. Richter stresses. That these effects do come out is important, he explains.

These are the kinds of permanent after-effects that the drug companies should watch, he concludes.

Science News Letter, August 8, 1959

## PUBLIC HEALTH

## Twice as Many Americans Have Health Insurance

TWICE AS many Americans have become covered by health insurance since 1948.

Likewise, the amount of benefits paid also increased, five times the amount paid through health insurance since 1948.

More than 61,000,000 Americans were covered by some form of health insurance in 1948. Within ten years, 123,000,000 persons were protected against the costs of medical and hospital care, the Health Insurance Institute in New York reported.

Benefits paid out in 1948 totaled \$772,000,000. By 1958 that figure had risen 500% to \$4.7 billion.

The extent to which the health care costs of the nation are being increasingly met through health insurance is shown by the fact that from 1952 to 1957 the nation's medical bill climbed by more than 50%, and health insurance benefits designed specifically for hospital and medical services increased 118%, the Institute said.

In 1948, benefits from health insurance paid 27% of the total costs of hospital services and six percent of the total costs of physicians' services in the U. S. In 1958, however, health insurance paid 60% of these hospital care costs and more than 30% of the physicians' costs.

Science News Letter, August 8, 1959



**COLLAPSIBLE DAM**—An inflatable dam, designed to be collapsed when flood danger arises, stretches 150 feet across the Los Angeles River. Manufactured by The Firestone Tire & Rubber Company, it is made of nylon coated with neoprene. It is inflated by pumping water into it. Eight feet in diameter, the giant bag holds 50,000 gallons of water when filled to capacity. It can be collapsed in ten minutes.

## TECHNOLOGY

**Magnetism Produced In Flexible Plastic**

► A FLEXIBLE plastic can be magnetized in any direction and can be chopped into all sizes and shapes without losing its magnetic properties.

Developed by the B. F. Goodrich Company, Akron, Ohio, the plastic is being produced in strips at the rate of more than ten miles a week. The strips are intended for use on refrigerator doors, both to insulate and to keep the doors shut by magnetic attraction.

Robert Shornstheimer, a Goodrich product engineer, said the plastic contains a magnetized metallic powder. He said the magnets are produced by melting a vinyl resin mixed with plasticizers and powder, then extruding the mixture in the desired shape, and finally running the strips through a magnetic field.

The poles, instead of being at the ends of the strips, extend the entire length, the north pole along one edge and the south pole along the other edge. The poles also can be reversed along a single strip at intervals, so that they run north-south, south-north, north-south, etc. Or, as in ordinary magnets, they can be induced at the ends of the strips.

The permanency of the flexible magnet is about twice that of some small metal magnets now in use.

Science News Letter, August 8, 1959

## PUBLIC HEALTH

**Polio Virus Widespread Throughout U.S. Now**

THE POLIO virus is now widespread in communities throughout the country, a U. S. Public Health Service official said.

Few areas of the country have, so far, escaped the effects of the virus. Paralysis has been reported from the north, south, east and west.

Health officials are concerned most about the preschool children. They are the number one candidates for this crippling summer disease, Dr. Glenn Usher, communicable disease center, told SCIENCE SERVICE.

Studies have shown that the Salk shots do not appear to break the chain of infection from the polio virus. This means that a person can be immunized against polio, yet carry the virus and infect others, some of whom will not be strong enough to build up a natural immunity. Paralysis can then occur.

The virus is usually accidentally swallowed by persons. Then it multiplies in the digestive tract. From there it is passed on in secretions from the nose and mouth or excreted. The virus can even pass from one person to another during a kiss. If a person has the virus in his digestive tract, he will not necessarily have polio, however, Dr. Usher said.

Commenting upon the recent rise in incidence of polio in this country, he explained the following general theory held by many health officials:

Polio hit the country heavily during the ten years prior to 1955. As a result, there was extensive natural immunity to the disease. In the several years since then, however, the Salk shots have not been given to enough people to fill the gap that natural immunity would have filled had the years since 1955 seen more polio.

In other words, a child born in 1955 or thereafter would not have had the opportunity to build up a natural immunity as did her sister who was born in the ten years prior to 1955.

The latest figures reveal that 177 paralytic cases were reported for the week ending July 25, setting the highest record for any week in 1959. The newly reported cases bring to 1,133 the total number of paralytic cases that have occurred this year.

Science News Letter, August 8, 1959

## PHARMACOLOGY

**Research Confirms Value Of Honey In Drugs**

HONEY, an oldtime home remedy for coughs and colds, may soon find itself mixed with the newest drugs.

The combination means better tasting tonics and wider use of honey, the U. S. Department of Agriculture reported.

Ferrous sulfate sirup, a popular iron tonic, was made with honey as the only flavoring agent. It was stable, "exceptionally palatable," and free of the astringent after-taste characterized by most iron medicines. Medicines in honey preparations settle very slowly and moderate shaking will again distribute the drug throughout the liquid. Vitamin B-2, or riboflavin, is especially stable in honey solutions, the researchers found.

The Philadelphia College of Pharmacy and Science carried out the honey research project under contract to the USDA's Agricultural Research Service.

Science News Letter, August 8, 1959

## ORNITHOLOGY

**Large Mainland Birds On Tropic Jungle Island**

ISLAND LIFE agrees with the birds, they apparently grow larger than their mainland contemporaries.

In a report on the uninhabited Caribbean jungle Isla Escudo de Veraguas, Dr. Alexander Wetmore of the Smithsonian Institution describes three new sub-species of birds. The birds, a blue tanager, a manakin and a tropical wren, are all mainland types apparently isolated on the four-square-mile island for thousands of years.

Although many of the size differences between the two types of birds would be too small for the average person to detect, a difference of 2.5 millimeters in bill length, for example, island birds one-third larger than mainland ones were observed.

Dr. Wetmore also obtained one spiny rat belonging to an unknown species. There are few other mammals, he said, except for wild pigs.

Science News Letter, August 8, 1959

**IN SCIENCE**

## ICHTHYOLOGY

**Sharks Trained to Ring Bell for Their Dinner**

A LEMON shark is no "lemon" when it comes to ringing the bell for its dinner.

Two captive sharks, a male and a female, were trained to feed at a target which, when pressed, caused a submerged bell to ring. They also learned to press an empty target and return for their food, researcher Eugenie Clark of the Cape Haze Marine Laboratory in Placida, Fla., reports.

After several weeks of getting their food in this way, the sharks "lost interest in food" as winter approached and the water temperature dropped below 24 degrees centigrade. However, when the water temperature rose, after some ten weeks had passed, the sharks readily pressed the target when it was presented to them. They had "remembered" or retained their conditioned responses.

An interesting observation of the sharks' feeding habits is that the female apparently will not press the food-target until the male's initial hunger is satisfied. There is no evidence to explain this, the researcher reports in *Science* (July 24).

Science News Letter, August 8, 1959

## GEOPHYSICS

**High H-Bomb Explosions Have Widespread Effects**

HYDROGEN bombs exploded high in the atmosphere have an immediate and widespread effect on the earth's magnetic field.

Dr. Hiroshi Maeda of Kyoto University, Kyoto, says he found "marked changes" in records of the magnetic field strength at Honolulu on Aug. 1 and 12, 1958, at times corresponding to high-altitude bomb tests.

These nuclear explosions were conducted in the upper atmosphere over Johnston Island last summer by the United States. Dr. Maeda says other Japanese scientists have found the two test explosions caused disturbances in ionospheric radio propagation, in atmospherics and in the ionosphere.

Dr. Maeda suggests the initial changes in records of the earth's magnetic field at places several hundred miles from the explosion are due to a shock wave having a high velocity, probably greater than a few hundred miles per second, and its ionizing effects. The main changes, occurring later, are due to an increase of electrical currents resulting from increased conductivity caused by ionization by high-velocity particles behind the shock wave.

Studies of these effects should help in understanding the theory of auroras and magnetic storms, Dr. Maeda reports in the *Journal of Geophysical Research* (July).

Science News Letter, August 8, 1959



## CE FIELDS

### MEDICINE

## Acute Heart Attack Can Bring on Peptic Ulcers

YOU CAN GET an ulcer from having a heart attack.

The important point to keep in mind, four researchers report, is that ulcer therapy should seriously be considered for persons who have suffered an acute heart attack.

Clinical studies by these investigators indicate that such heart attacks, known as myocardial infarctions, may be associated with increased gastric secretions. This means that old peptic ulcers can again become troublesome, or that new ones can appear, the doctors report in the *New England Journal of Medicine* (July 30). A peptic ulcer can occur on the mucous membrane of the esophagus, stomach or duodenum. It is caused by the action of the acid gastric juices.

This report does not propose to examine the controversial question of whether peptic ulcers occur more commonly in patients with coronary artery disease than in the general population, the scientists emphasize.

Instead, on the basis of six cases on which their report is based, they write:

"The course of acute myocardial infarction may be suddenly complicated by the development of serious manifestations of active peptic ulceration. . . . That such an association may be more than coincidental, however, is suggested by the occurrence of acute peptic ulceration during a variety of stressful situations."

Thus, anti-coagulants, drugs that delay blood clotting, should be withheld or used with extreme caution, Drs. Joseph C. Shipp, Victor W. Sidel, Robert M. Donaldson Jr. and Seymour J. Gray, all of the Peter Bent Brigham Hospital, Boston, conclude.

Science News Letter, August 8, 1959

### ENGINEERING

## Ultrasensitive Radar For Front Line Detection

### See Front Cover

RADAR THAT can tell the difference between a WAC and a "GI," as long as they are moving, will soon provide the U.S. Army with a supersensitive detector.

Described as the only ground-to-ground radar that can detect moving targets at long range in fog or darkness, the "movement monitor" can be set up in a front line position in less than one-half hour.

The radar will spot a rolling tank at ten miles or a soldier crawling on the ground two miles away, the U.S. Army announced. It can detect the soldier if any part of his body moves more than one mile an hour.

In one test, under ideal conditions, the set spotted a walking soldier 15 miles away.

The photograph on the cover of this week's *SCIENCE NEWS LETTER* shows four radarscope graphs. They are, left to right, a train, an automobile, a man walking, and a girl walking.

Each type of target produces a characteristic sound in the radar. An experienced operator can distinguish between the sounds of a walking soldier or those of a jeep. In addition, the operator can watch the set's radarscope and obtain more precise information on a target's position and direction of movement.

The monitor set scans a 30-degree sector of a field. When the operator hears a suspicious motion, he can "zero" in on the target and narrow the radar beam. A tiny indicator light mounted under a map of the area shows the target's position while numerical dials give it with greater exactness.

Developed jointly by the U.S. Army Signal Research and Development Laboratory at Fort Monmouth, N. J., and the Hazeltine Corporation of Little Neck, N. Y., the radar is a part of an overall program under the direction of the U.S. Combat Surveillance Agency.

The portable shelter containing the controls and displays and a separate antenna mounted inside a five-foot plastic bubble on a 25-foot pole can be set up quickly at a remote but strategic position. It can be transported by helicopter or on a small two-wheeled trailer.

Science News Letter, August 8, 1959

### ELECTRONICS

## New Method Detects Silent Satellites

A METHOD for detecting satellites whose radio transmitters are no longer operating is now available. It was devised by three "ham" radio operators.

They found that each satellite builds and carries along with it a cloud of ionized particles, and that this cloud can be detected by listening to disturbances it causes in the radio transmissions of WWV. WWV is the National Bureau of Standards' broadcast station carrying standard time signals at various frequencies.

Two very different types of disturbances at a frequency of 10 megacycles were found by Clay Roberts, Paul Kirchner and Dave Bray of the General Electric Company's Advanced Electronics Center, Cornell University, Ithaca, N. Y. Another effect was found at the 20 megacycle frequency, a fast flutter, similar to the familiar airplane flutter seen on TV screens.

The scientists have dubbed the two effects at 10 megacycles, "Doppler" and "Rumble." Both are audible radio tones, they report in *QST* (August), official journal for amateur radio fans.

The ionospheric effects have been recorded from the two sections of Sputnik III, and from the lost satellite, Discoverer I. Their project is being continued using GE facilities.

Science News Letter, August 8, 1959

### EVOLUTION

## Lizards in Mink Throw Light on Evolution

MORE KNOWLEDGE on how fur and feathers originated in the distant evolutionary past is being provided by lizards wearing mink and chinchilla coats.

Dr. Raymond Cowles, zoologist at the University of California, Los Angeles, has devised experiments with fur-swathed desert lizards known as chuckwallas to demonstrate an insulating effect against vital heat absorption by cold-blooded animals.

Results of the experiments suggest that furs and feathers developed in an age when temperatures were warm and steadily rising rather than in a cold age as has been thought by most authorities in the field.

Cold-blooded animals, having no internal heat-producing activity such as the warm-bloods, draw their heat from their environment, Dr. Cowles points out. Insulating furs retard heat absorption. Hence a cold climate would not favor survival of fur-bearing (and thus insulated) reptiles.

Experiments with desert lizards have suggested that the skin temperature-regulating mechanisms which help control inflow and outflow of heat may have developed in ancient amphibians and then been passed on to reptiles and subsequently mammals.

Modern reptiles use the skin vascular system as a heat absorbing medium from which sun-warmed blood is transported via veins to internal tissue. In warm-blooded animals the same type of mechanism has a reversed effect with blood carried to the skin surface radiating heat to a normally cooler environment.

While there is fossil evidence that feathers developed before the main age of reptiles, no fossil evidence of furs has been found, Dr. Cowles points out.

Science News Letter, August 8, 1959

### MINERALOGY

## Search for Microbes That Will Refine Oil

ATTEMPTS to use microscopic organisms to refine oil are being made at Louisiana State University. If the research is successful, it could lead to radical changes in certain oil processing methods.

The research is being directed by Dr. Raymond J. Strawinski, who several years ago devised an inexpensive method of locating oil deposits with the aid of microbes.

Just as the human body acts as a catalyst to change the chemical structure of foods, he reported, certain microorganisms should exist that can change hydrocarbon-like structures to purify petroleum fractions. It is hoped that the catalytic life processes of some organisms might act on certain chemical structures in oil to change or remove them.

Esso Standard Oil Company has granted Dr. Strawinski more than \$27,000 for his microbe research. The grant will finance two years of study by Dr. Strawinski and two doctoral candidates at LSU.

Science News Letter, August 8, 1959

## EDUCATION

# Changes in Grim, Gray Halls

Profound changes are taking place in our national museums. The museum that displayed stuffed creatures in cases now presents the living history of animals and man.

By BENITA TALL

THESE HOT, summer days thousands of persons in hundreds of cities, large and small, across the nation will enter museums to escape the heat and "sight-see."

They will enter anticipating an hour-long stroll through cool, grim, gray halls filled with cases of stuffed birds and animals, pottery whole and pottery broken, arrow heads, and, depending on the museum, walls covered with time-darkened oil paintings.

If this is what the museum visitor expects to see, he is going to be surprised. Museums "ain't what they used to be."

Instead of grim, gray halls there are bright rooms and halls with intriguing little alcoves to wander through. Instead of stuffed birds and animals there are lifelike tableaux consisting of birds, animals and plants in their natural surroundings.

The "human animal" is also shown in a realistic setting. Museums once displayed man and his things in glass cases—cases upon cases of ancient skulls, cloth fragments, belts of wampum, beads and skins. Occasionally a museum would have a small model showing tin-soldier-sized natives at work weaving, fishing or hunting. Now man and his tools are displayed together. Clothed in deerskin and "real" woven garments, the American Indian has his bow bent, the arrow shaft tipped with a "real" arrow head. The Eskimo paddles his kayak while the women on shore prepare seal skins. The Indian from the Amazon jungle stands in luxuriant tropical foliage as he aims and blows a poison dart at a bird.

In fact, the museum today is such an exciting place, the visitor may find it difficult, despite tired feet, not to wander through jungles, deserts, plains and Arctic ice for many hours looking at animals and peoples he may never meet.

This basic change in the theories of how museums can best display their wares, from glass cases to habitat groups, has been greatly helped by modern technology and materials. Even modern art and advertising have helped.

Lighting can be used to dramatize a display as never before dreamed possible by a curator. It can be diffused or pinpoint special items. Recorded music adds realism to a scene, contributing bird song or jungle sounds where they are required.

Color is being used creatively, not only to add to the beauty of a display but to help in the communication process. The maps, simple drawings, graphs and similar visual devices that now so often appear with specimens and museum material are another example of the contribution the

graphic arts make to our modern museums.

It is even pleasant to learn as well as look in museums today. This, too, represents a change in emphasis with respect to the purpose of museums, whether they are art museums or natural history museums.

One hundred years ago museums might have been described as curio shops. They were a reflection of the contemporary vogue for stuffed animals. If a wealthy man's home was incomplete without an arrangement of stuffed birds, a trophy room and a stuffed pheasant on his library mantle, so a museum served its purpose as a large display case for the curious, rare or unusual. Hunters, explorers, anthropologists and archaeologists could unload their findings at the museum. Then the public could gaze at the strange things and marvel.

Today's museums are not receptacles for curios. They welcome private collections, yet their function in the community today is much broader. Education might be the best single word to describe this function.

Beginning with its school program, the museum's efforts at teaching include college students, scientists, housewives, and amateurs in many fields from bird watching to telescope making. Sometimes the museum merely provides room and equip-

ment. Or a staff member may join the group. Currently many museums are adding to their teaching capabilities with the help of electronics and radio. Displays are wired for sound so that a museum visitor can look at his own speed and, when he chooses, he can "plug into" an exhibit and learn more about what he sees.

Museums even go out. Exhibits of particular interest to schools are often sent to them for brief periods of time. One Florida museum has a school program in which the classes borrow suitable exhibits on a regular schedule that fits in with the students' studies.

Basic and applied research are also carried on by many museum staff members. These scientists, experts in fields ranging from mineralogy to ecology to ornithology to "plain" biology, often conduct their own research studies supported by museum funds. Sometimes the study is directly related to a museum problem. However, just as often it concerns a basic problem such as one in bird physiology. Results of these researches have contributed to human medicine, plant breeding and psychology. Even crime detection has been helped!

The scientific crime detection laboratory in Chicago regularly obtains assistance from the Chicago Natural History Museum in identifying evidence. Museum botanists can often tell what kind of plant a bit of pollen came from. With the botanists' knowledge of the plant and its growing habits, sites where the plant is found might be sug-



**HALL OF HEALTH**—This new exhibit at the Smithsonian Institution takes the museum visitor on a tour of the human body and the problems of maintaining good health. The Hall features many of the modern devices in lighting and display being practiced by museums throughout the country.

gested, thus enabling the police to begin a search for the scene of a crime. Or, X-ray diffraction methods and X-ray spectrography may provide the essential evidence.

Another example is the cooperative project in which Dr. Herbert Friedman of the Smithsonian Institution is working with biochemists and others on the physiology of the honey guide bird. This may result in a method for breaking down the protective waxy coating of some bacteria.

Collecting new specimens continues to be an important museum activity. Museum-supported expeditions explore many of the exotic regions of the world, bringing back some of it for the stay-at-homes.

Today no one can criticize our museums as mere curio shops. They are dynamic institutions, actively seeking knowledge and better ways to communicate their findings to us on those days when we wander through their gay, bright halls.

Science News Letter, August 8, 1959

#### ENGINEERING

### Pills for Rockets May Mean More Thrust

PILLS for rocket engines could help cure a costly "disease": corrosion.

Untimely chemical reactions in both liquid and solid rocket fuels could be avoided by putting special fuel additives in capsules. Proposed additives include oxidizers, to give more power to the engine, and "dampers," to control the rate of fuelburn. Some reactive chemicals are now avoided because they will eat out the insides of rockets.

By putting them in capsules, the Southwest Research Institute, San Antonio, Texas, reported, the disease of corrosion might be overcome. To achieve this goal, SRI scientists have developed two ways to make pills. Some as small as pinheads, the capsules use magnesium, aluminum, glass and paraffin for "skins." (Gelatin is used for medical pills.)

A gravity feed apparatus is the basis for the first manufacturing technique. The film, or encapsulating material, and the filler flow into a chamber where the film material spreads across an opening. The film deforms under the weight of the filler and finally falls through the hole. Surface tension of the film shapes the capsule into the proper form.

A nozzle device makes smaller capsules. Here, the combined film and filler material is flung against the hardening bath which covers a rotating wall. Changes in the size of the nozzle opening and the speed of rotation make it possible to vary the size of the capsules.

Science News Letter, August 8, 1959

#### CHEMISTRY

### Molten Salts Suggested For Reactor Fuel

A BETTER FUEL for high temperature nuclear reactors than the uranium metal rods now in use may be uranium salts which are mixed with other molten salts.

So says Dr. Haakon Flood of Norway, an authority on molten salt chemistry, basic also in metallurgy and ceramics.

He is visiting professor of engineering at the University of California, Los Angeles, and also serving as adviser to American atomic installations on chemical problems of fueling reactors with uranium salts.

He explains that uranium metal rods have two major disadvantages. They lose their shape when exposed to radiation from the fission process. And they do not work continuously, since the rods have to be taken out of the reactor to remove impurities caused by fission products.

Reactors using molten uranium salts may overcome these disadvantages. The salts, in liquid form, do not change shape, and can be continuously purified by a cycling process, in which the liquid is pumped out, purified and returned to the reactor.

On the other hand, the use of molten salts raises some new problems, such as finding the proper material for the salt containers. Important investigations along these lines have been reported by the Oak Ridge laboratories.

During the fall semester, Dr. Flood will teach a special UCLA course in high temperature salt chemistry. In his own country, he is professor of inorganic chemistry at the Norwegian Institute of Technology, and head of the Institute of Silicate Science.

Science News Letter, August 8, 1959

#### MEDICINE

### Non-Drinking Moslems Develop Liver Cirrhosis

MOSLEM MEN and women of the Sahara desert develop cirrhosis of the liver at an early age despite the fact that these people do not use alcohol.

These persons also had more than their share of liver cancer, a team of investigators report in the University of Chicago Press's *Cancer Research* (July).

A total of 238 Negroes from French West Africa were found to have cirrhosis of the liver. Cancer of the liver was found in 104 of these individuals.

The average age of the cirrhotic group studied, the majority of whom were Moslem, was 34.6 years. Females appeared to be less prone to the disease, but this may be due to the fact that females are less likely to go to a hospital than males. Curiously enough, those patients with both cirrhosis and cancer of the liver lived longer than did those with cirrhosis alone, Dr. Paul E. Steiner of the University of Pennsylvania points out.

He reasoned that the person whose liver ceases to function will die soon, while the person with a healthier liver may live longer, during which time the liver may also develop cancer.

An additional 238 cases were studied for cancer of the liver. Some of these had cirrhosis. But the scientists found cirrhosis did not aid the development of cancer. Malignancies occurred as early, if not earlier, in the noncirrhotic liver, they emphasize.

The average of the victim of cancer of the liver was 36 years. They offered no reason for the development of cirrhosis in these Africans.

Drs. Robert Camain of the Institut Pasteur, Dakar, and J. Neuk of the Hôpital le Dantec, Dakar, French West Africa, assisted Dr. Steiner.

Science News Letter, August 8, 1959

## OPTICAL BARGAINS



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# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**ALCOHOLISM: The Nutritional Approach**—Roger J. Williams—*Univ. of Texas Press*, 118 p., \$2.50. Dr. Williams, a biochemist, treats alcoholism as a physical disease. Usually caused by a deranged cellular metabolism, it is the result of some unsatisfied nutritional need. The author suggests nutritional means to help alcoholics to remain abstinent.

**APPLIED HYDRODYNAMICS**—H. R. Vallentine—*Butterworths (Canada)*, 272 p., \$10. Introductory course to hydrodynamics for students of applied mathematics or as a course in fluid dynamics for graduate students of engineering.

**AUTOMATION, CYBERNETICS AND SOCIETY**—F. H. George—*Philosophical Lib.*, 283 p., illus., \$12. Presents the facts and organizational aspects of automation, then discusses some of the social changes which scientific planning will bring. For the general reader.

**THE CANTERBURY PUZZLES and Other Curious Problems**—Henry Ernest Dudeney—*Dover*, new ed., 255 p., illus., paper, \$1.25. Reprint of 4th edition with note on British coins and stamps added for the American reader.

**DISCOVERING THE HEAVENS: A Junior History of Astronomy**—I. O. Evans, foreword by Patrick Moore—*Roy Pubs.*, 208 p., illus., by Patricia A. Cullen, \$3.50. Tells young people the story of man's discoveries about his universe from the time of Stonehenge to the twentieth century with its artificial moons. Bibliography included.

**EDUCATORS GUIDE TO FREE FILMS**—Mary

Foley Horkheimer and John W. Diffor, Eds.—*Educators Progressive Service*, 19th ed., 649 p., paper, \$7. Lists 4,223 free film titles with short descriptions, includes subject and source index, features article by John Guy Fowlkes on "Audio-Visual Media in School Improvement."

**ELECTRICITY MADE SIMPLE**—Henry Jacobowitz—*Made Simple Bks. (Garden City Bks.)*, 190 p., illus., paper, \$1. Written for self study, includes 25 basic experiments that can be done at home.

**GRASSLANDS**—Delia Goetz—*Morrow*, 64 p., illus., by Louis Darling, \$2.75. Introduces the young reader to the plants and animals of the vast prairies, steppes, pampas and savannas of the world.

**HIGHER EDUCATION IN THE USSR**—Prof. Vyacheslav Yelyutin—*Intl. Arts & Sciences Press*, 55 p., illus., paper, \$1. The Minister of Higher Education of the USSR writes about the aims and general organization of Soviet universities and institutes.

**INTERMEDIATE ALGEBRA AND ANALYTIC GEOMETRY MADE SIMPLE**—William R. Gordon, practice exercises and answers by Bernard Sommer—*Made Simple Bks. (Garden City Bks.)*, 192 p., paper, \$1.50. For self-study and review, presents mathematics as a way of thinking which lends itself to abbreviated treatment.

**MANUAL OF SCIENTIFIC RUSSIAN**—Thomas F. Magner—*Prentice Hall*, 101 p., paper, \$3.95. Textbook seeking to develop rapidly an ability to read involved Russian texts.

**MOLECULES AND MENTAL HEALTH**—Frederic A. Gibbs, Ed.—*Lippincott for the Brain Research Foundation*, 189 p., illus., \$4.75. Discussions of drug treatment of the brain which "thinks, sees, hears and, most important, understands because of chemical processes that are going on continuously in the 10 billion chemical machines (nerve cells) which populate the universe between our ears."

**THE NATIONAL FORESTS**—Arthur H. Carhart, introd. by Joseph W. Penfold—*Knopf*, 298 p., illus., \$4.75. A naturalist takes the reader through some of the 180,000,000 acres of U.S. National Forests which were set aside to pro-

duce public timber and protect our vital watersheds.

**THE NEXT TEN YEARS IN SPACE, 1959-1969: Staff Report—Select Committee on Astronautics and Space Exploration—*Cong. Print. Off.***, 221 p., illus., paper, 60¢. Summary of the thinking of the leading scientists, engineers, industrialists, military officials and Government administrators concerned with our national space program.

**PRINCIPLES OF ORGANIC CHEMISTRY**—T. A. Geissman—*Freeman*, 635 p., illus., by Roger Hayward, \$7. Introductory course, presenting theory as an integral part of the behavior of organic compounds.

**THE PURSUIT OF THE ATOM**—Werner Braunbek, transl. from German by Brian J. Kenworthy and W. A. Coupe—*Emerson Bks.*, 242 p., \$3.95. An account of the world-wide researches that led by varied routes to our present knowledge of the atom and of the individual scientists whose contributions made that knowledge possible.

**THE RELATION OF FUNGI TO HUMAN AFFAIRS**—William D. Gray—*Holt*, 510 p., illus., \$8.50. Textbook emphasizes the useful side of fungus activity in such fields as medicine, alcoholic fermentation, food processing and the manufacture of drugs. In conclusion the harmful activities are examined. Four courses in applied mycology and for general reference.

**SCIENCE, MEDICINE AND MORALS: A Survey and a Suggestion**—Charles E. Raven—*Harper*, 189 p., \$3.50. Traces the interacting influence of science and philosophy from Greek cosmology to modern physics in language the layman can understand.

**THE SENSE OF MUSIC**—Victor Zuckerkandl—*Princeton Univ. Press*, 246 p., 32 p. of scores, \$6. This book addresses itself to the alert mind that is not satisfied with "blind" musical experience. In an original way it helps the listener to understand the why and how of melody, key, meter, rhythm, polyphony and harmony.

**SPACE PROPULSION: Hearings—U. S. Congress, House Committee on Science and Astronautics**, 307 p., illus., paper, single copies free upon request direct to Committee, Washington 25, D. C. Transcript of statements on recent advances in space propulsion by leaders of the industry.

**TRAFFIC ACCIDENT STUDIES 1958**—Bruce D. Greenshields and others—*Highway Res. Bd.*, Bull. 208, 83 p., illus., paper, \$1.60. Statistical and economic evaluation of traffic accidents, techniques for predicting traffic accidents, and sampling procedures for determining speed characteristics.

**THE TWENTY-MINUTE LIFETIME: A Guide to Career Planning**—Gavin A. Pitt, Richard W. Smith, Asst.—*Prentice-Hall*, 178 p., \$1.95. Helps orient the college graduate about careers in education, government, industry and the professions, to prepare him better for his employment interview.

**X-RAY DIFFRACTION BY ASSEMBLAGES OF LINE SCATTERERS WITH APPLICATION TO LINEAR POLYMERS**—Leroy E. Alexander and E. R. Michalik—*Mellon Institute*, 5 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

Science News Letter, August 8, 1959

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## ENGINEERING

## Foresee End of Spare

NEW IMPROVEMENTS may soon end the days of the spare tire.

The improvements being considered by three companies are based on the idea of a tire within the tire. In effect, the tires would have built-in spares.

In addition to the obvious advantage of increased trunk space, the company spokesmen pointed out that elimination of the spare would decrease car weight and allow greater freedom of styling.

The dual compartment tire, being developed by the B. F. Goodrich Tire Company and the Goodyear Tire & Rubber Company, consists of two chambers, one inside the other. Each compartment is inflated through a separate valve. In case of a blowout, the inner tire would serve as a crutch to get the car to a service station. Tests conducted by Goodyear on taxicabs revealed that both outer and inner tires were punctured in only six percent of the blowouts.

The reserve chamber tire, under development by United States Rubber Company, has a deflated inner tube within the regular tire. If the outer tire is punctured, the "safety diaphragm" can be inflated with a seven and one-half-inch-long cartridge of compressed gas. This allows the motorist to continue for "many miles" before repairing his tire.

General acceptance has received considerable attention in eliminating the spare: "Every possible assist must be given the spare-elimination proposition if it is to overcome the psychological resistance present in the general public," said the spokesman for Goodrich.

Company representatives who presented the talks to the Society of Automotive Engineers' meeting in Atlantic City were: R. E. Davies for Goodrich, Walter Lee for Goodyear, and H. B. Hindin for U.S. Rubber.

Science News Letter, August 8, 1959

## CHEMISTRY

## Radioisotopes Calculate

RADIOACTIVE ISOTOPES soon may be used by oil refineries to calculate bills for some of their customers, Esso Research and Engineering Company has announced.

Hydrogen sulfide, a by-product of oil refining, is sent to sulfur recovery plants with some other impurities. At the recovery plants, sulfuric acid is prepared from the hydrogen sulfide for industrial uses.

To determine how much to bill the sulfur recovery plants for the hydrogen sulfide, the refineries must know what percentage of the by-product was actually usable hydrogen sulfide. To find the percentage, iron 55, a radioactive isotope, is placed in a small cell

in the gas line carrying the hydrogen sulfide waste from the refinery.

Rays from the iron 55 are absorbed by the sulfur in the hydrogen sulfide. By seeing what quantity of the iron's energy rays are absorbed, the amount of sulfur present can be determined. Knowing the amount of sulfur, one can find the quantity of hydrogen sulfide. And, knowing the amount of hydrogen sulfide, the refinery can send out its bill.

The cost of the analyzer is estimated at \$3,000 to \$4,000. Some minor problems must be solved before the device is ready for commercial market, Esso reported.

Science News Letter, August 8, 1959

## ENGINEERING

## Sensitive Radar "Talks"

A SUPERSENSITIVE radar that can "talk" to an intercontinental ballistic missile to keep it accurately on its target course is being developed for the U. S. Air Force.

It was disclosed that General Electric's Ordnance Department is building the ultra-high-precision antenna for the radar tracking system. This has solved a local mystery surrounding a new GE plant in a remote section of the Berkshire Hills.

The antenna is to be so accurate that it will distinguish the north from the south end of a 100-foot house in Los Angeles more than 2,500 miles away—if radar could be transmitted directly between these two points.

The antenna will focus the electronic radar beam on the flying missile and report instantly and precisely the position of the flying missile. An electronic computer will

put out corrections and feed them to the radar. The radar will relay them to the missile to effect automatic, fast correction of flight errors.

All of this must be done rapidly to establish the missile on the calculated trajectory that ends at the target.

A one-degree launch error could cause the nose cone to miss its bull's-eye by about 100 miles. The corrections must be made before the missile goes out of the radar's reach, or before it burns up its fuel.

Such high precision is required that the manufacturing plant had to be built on exceptionally stable earth, and in a place free of vibrations from railroads or highways. Across a valley on another mountain-side is situated a radio-frequency transmitter for aligning and testing the tracker units.

Science News Letter, August 8, 1959



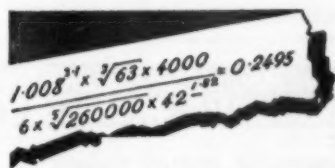
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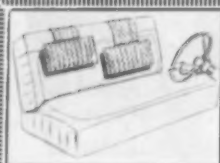


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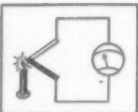
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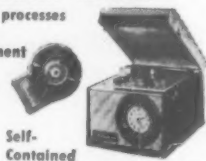
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## Questions

**ANTHROPOLOGY**—What are some characteristics of the Old World grape? p. 84.

**ASTRONOMY**—Why must rocket velocity be changed from conventional units to astronomical units? p. 83.

**CHEMISTRY**—What are the major disadvantages of uranium metal rods in nuclear reactors? p. 91.

**OCEANOGRAPHY**—What is one possible way the temperature of prehistoric seas may be determined? p. 86.

**PUBLIC HEALTH**—To what group of bacteria does typhoid belong? p. 82.

Photographs: Cover, U. S. Army; p. 82, A. Scholes; p. 83, University of California; p. 85, U. S. Air Force; p. 86, American Standards Association; p. 87, Firestone Tire and Rubber Company; p. 90, Smithsonian Institution; p. 96, Hood Rubber Company.

## Do You Know

Fruit should not be set in a sunny window to ripen, because overheating is likely to cause the fruit to decay before it can ripen.

The total number of forest fires in the U.S. was under the 100,000 mark for the second year in a row in 1958 with 97,910 fires reported.

Water supplies of 1,903 cities and towns in the U.S. with a combined population of 7,000,000 contain enough fluoride naturally to prevent two out of three dental cavities.

It has been estimated that 10,000,000 Americans spend \$500,000,000 annually for dietary supplements, concentrates, pills and capsules claimed to be "cure alls."

Malaria, until recently, caused more deaths and chronic ill-health in the world than any other single disease.

Farmers are almost twice as likely as city dwellers to fall victim to the U.S.'s greatest cripper, arthritis.

### TEXTILE TECHNOLOGY

## New Treatment Increases Cotton's Rot Resistance

A CHEMICAL treatment that makes cotton fabric more resistant to rot and weather promises to open new markets for cotton in awnings, tents, tarpaulins and other outdoor fabric items.

Developed for the U. S. Department of Agriculture by its Agricultural Research Service, the treatment is based on use of a water-soluble acid colloid of methylolmelamine, a chemical well known for its resin-forming qualities.

The resin penetrates the outer portion of the fiber cell wall to become a part of the fiber rather than just a coating. It thus makes cotton virtually immune to rot and mildew.

In tests using soils containing fabric-destroying bacteria, untreated cotton was in shreds after one week, while treated cotton retained 100% of its breaking strength after 21 weeks.

Other research has shown that the treatment can be used with some fabric-coloring pigments to increase cotton's resistance to deterioration by sunshine.

Science News Letter, August 8, 1959

### ZOOLOGY

## Insect-Eating Bird Flocks Follow Paths of Ants

THE HORDES of foraging army ants that march across the jungle floor leaving desolation in their path are followed by large flocks of insect-eating birds that swoop down upon insects driven from their hiding places by the devastating ants.

This strange natural partnership between birds and ants is being studied at the Smithsonian Institution's jungle reservation on Barro Colorado Island, Canal Zone, by Dr. Robert Barth of Harvard University.

Dr. Barth has found that the mixed bird flocks apparently never bother the ants themselves. Instead, they feast on grasshoppers, worms, tarantulas, etc., that flee the ants' path.

The nucleus of such a bird flock is composed of the black and white jungle "ant-birds," so called because they follow ants rather than because they eat them.

About a half dozen other species also are found in the flock. These attach themselves somewhat like camp followers, mixing freely with the main flock. They include puffbirds, motmots or "time birds," wrens, flycatchers and tanagers.

A glimpse of such a bird flock is almost certain evidence that a major ant column is moving along the jungle floor below with a front varying in width from three to 20 yards.

The same bird group may follow the same ant columns for days, and even the smallest of the birds descend fearlessly among the ants, apparently unmolested by them.

Science News Letter, August 8, 1959

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**MINIATURE MIXER** powered by a flash-light battery mixes bar drinks, chocolate milk, baby foods, gravies and salad dressings. The four-ounce mixer is operated by pressing a button. It has a polished chrome finish and stainless steel removable beater.

Science News Letter, August 8, 1959

**AUTOMATIC FIRE ALARM KIT** for home and farm can be installed with a screwdriver and hammer. The alarm goes off if the temperature reaches a pre-set level. There are six fire detector elements, each of which monitors 2,500 square feet, a control panel with battery and battery power supply gauge, and other installation supplies.

Science News Letter, August 8, 1959

**IRON-LIKE ADHESIVE** is said to repair everything from a broken chair leg to a cracked engine block. It is a putty-like synthetic plastic that becomes a substance like iron a few hours after it is mixed with a clear liquid hardener. After hardening, the adhesive, also useful as a filler, can be ground, sanded, filed or drilled.

Science News Letter, August 8, 1959

**INDUSTRIAL GLOVES** coated with tough synthetic rubber are said to be flexible enough to enable a worker to thread a needle. The gloves, shown in the photo-



graph, resist oils, chemicals, acids and greases and are recommended for workers in food, dairy, chemical and petroleum industries.

Science News Letter, August 8, 1959

**ELECTRIC TIMER** can be attached to any appliance, including air conditioners, fans, washers, coffee makers and radios. The plug for the appliance is inserted into the timer's plug, which is then plugged into an

outlet. The dial can be set to shut off at any time up to one hour.

Science News Letter, August 8, 1959

**AUTO SPEED STABILIZER** for turn-pike driving will hold the car at a constant speed. The electronic unit is set in operation by pressing a button on the floor near the dimmer button. Pressing the button a second time, or pressing the brake pedal, automatically releases the speed stabilizer. Attached to the carburetor, the stabilizer is said to increase gas mileage considerably on any make car.

Science News Letter, August 8, 1959

**COMBINATION A.W.L. SCREWDRIVER** has a bradawl that starts a hole in wood and a screwdriver to insert the screw into the hole. The bradawl is put into position for use, or withdrawn, by a thumb-controlled guide ring.

Science News Letter, August 8, 1959

**DIVING PLATFORM** is made of a two-foot-square piece of canvas stretched across an aluminum frame and can be used at swimming pools or lakeside summer homes instead of heavier and more expensive diving boards. The forward edge of the canvas is supported by a nylon web strap, instead of aluminum, for safety.

Science News Letter, August 8, 1959



## Nature Ramblings



### By HORACE LOFTIN

YOU CAN SEE the headlines now: Man Descends From Mole!

But that will be a mistake, as big a mistake as once was, and still is, made by saying that man is descended from monkeys. Man is descended from a common ancestor with the monkeys; likewise, as you will see, man, monkeys and moles have a common ancestry somewhere back in the dim, early days of mammalian history.

What do moles and human beings have in common that places them out on the same big limb of the family tree? Moles belong to the primitive order of mammals called insectivores, or insect-eaters, along with the shrews and hedgehogs. Man, on the other hand, occupies a place in the order of primates, along with the apes, monkeys and several more primitive creatures like the lemurs of Madagascar (see illustration) and the tarsiers of the East Indies.

Looking at extremes of either order, let

### Of Moles and Men



us say moles versus human beings, it is difficult indeed to find any points of similarity.

But less specialized examples of both insectivores and primates are quite similar in both structure and habits. In fact, there is a "missing link" animal in the East Indies that bridges the two orders so nicely that scientists still debate whether to call it a primate-like insectivore or an insectivore-like primate!

This puzzling creature is known as the tree shrew (family Tupéidac). The latest authority in mammalian classification places it in with the primates. The animal passes most of its life in trees, looks and acts something like a lemur, but its teeth and other bodily structures show it to be very close to the insectivores.

It is just one step forward from this tree shrew to the lemurs, which beyond all doubt represent very primitive types of primates, probably close to the ancient primate from which man descended. On the other hand, it is just one step backward from this little missing link to the shrews, and another step to the side, so to speak, to the rather specialized moles.

So from an evolutionary point of view, it appears that man and moles are rather close kin, certainly much more closely related than, say, man and the cats or bears. But, please! We did not say man is descended from moles.

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